Changes in drug use among Belgian higher education students: a comparison between 2005, 2009, and 2013

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Abstract

Background

Most drug users initiate illicit drug use during adolescence and young adulthood. Although in the general population a trend towards a decrease in drug use can be seen, patterns of drug use among students are unclear.

Objectives

The objective of the study was to look at drug use patterns among students in higher education in Belgium.

Methods

To gain more knowledge about the drug use of students, a survey study in Antwerp (Belgium) was conducted on three occasions (2005, 2009 and 2013) at several institutes for higher education. Students (total sample size 24,478; 29,210 and 31,950 respectively) were asked if they had used legal or illicit drugs in the past year. To compare whether drug use differed between the separate years, $\chi^2$-tests were performed on past-year drug use for all three time points. If significant, $\chi^2$-tests between pairs were performed. Gender and age differences were also analysed.

Results

Results comparing the selected periods indicated that the use of non-distilled alcohol, spirits and cannabis decreased and that no change in student’s use patterns was seen for beer, wine, sedative hypnotics, stimulating medication, XTC, cocaine or amphetamines. Tobacco use decreased initially, but increased in 2013. More men indicated having used drugs in the past year than women. Only for cannabis did more younger students indicate having used in the past year.

Conclusions/Importance

These results show that drug use among students is a complex matter that could be influenced by a number of things, among which are social norms. In order to have an effective prevention programme to decrease drug use, lessons learned from the social norms approach could be helpful. The data from this study could provide insights for academic and governmental bodies and health care professionals into the use of drugs by higher education students since this subgroup shows specific use patterns.
Introduction

Legal and illicit drug use in the general population is highly prevalent, although the percentage of persons in the European Union indicating having used any legal drugs, such as alcohol (at least 73.5%) or tobacco (at least 48%) (Degenhardt et al., 2008) is much higher than estimates for illicit drug use. According to the 2014 European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) drug report (EMCDDA, 2014), a quarter of all European adults (15-64 years of age) have ever used illicit drugs. Of all European adults, 21.7% indicate having ever used cannabis, 4.2% have indicated using cocaine at least once in their lifetime, and 3.1% had used ecstasy at any point. Among students, these numbers are similar. A recent Europe-wide study has shown that at least 90% of all adolescents (age 17-18 years) had ever used alcohol, 72% smoked, and 15% admitted to having used any illicit drug (Andersson et al., 2007), although it must be noted that use patterns vary widely between the different countries.

Both legal and illicit drug use can have a number of consequences at a personal level and at a societal level. These consequences include, but are not limited to neuropsychiatric disorders (such as depression and schizophrenia), cardiovascular, renal or urinary disease (Degenhardt & Hall, 2012), legal repercussions and increases in criminal and delinquent behaviour (Dobkin & Nicosia, 2009; Reuter & Kleiman, 1986). Most of these issues only (start to) arise after a period of use and do not happen to all persons who ever used a certain drug. However, a particular risk factor in continuing drug use and possible consequent drug addiction is the age of initiation of drug use (National Institute on Drug Abuse (NIDA), 2003). Young adults aged between 18 and 25 are more likely to use legal and illicit drugs than any other age group (Young et al., 2002). Since this is usually the age at which a person goes on to study in a higher educational setting, that makes this group particularly interesting in studying the evolution of drug use in a higher education over a period of time. This would allow us to see how patterns of drug use change over time between different student cohorts. Furthermore, knowledge about the number of students using drugs could be of interest to governing bodies of higher education institutes and public policy.

Therefore, the current study was aimed at comparing the occurrence of drug use among students of several institutes for higher education in Antwerp, Belgium over a period of 8 years. During these 8 years, at three time-points (2005, 2009 and 2013) the student population was asked to fill out a questionnaire focusing on legal and illicit drug use.

Methods
Participants and recruitment

Data reported in this study are part of an ongoing cross-sectional study initiated by the University of Antwerp and the Organisation for Alcohol and other Drug Problems (VAD). All participants were students at four institutes for higher education in the region of Antwerp, Belgium.

The data used covers 8 years in total, with questionnaires being administered in 2005, 2009 and 2013. Each time, the survey was undertaken in the second semester of the school year, from February until April and students could fill out the questionnaire online. An accompanying letter explained the purpose of the study. Flyers and posters were distributed on all campuses to ensure visibility of the study and increase responses. From the respondents of all three questionnaires (2005, 2009 and 2013) separately, a randomly selected stratified sample was drawn to accurately represent the Antwerp student population. The strata used were (1) the student’s institution and (2) gender. The number of students in each sample was determined using a confidence level of 95% and confidence interval of +/-2.5% with a response distribution of 50%. In Table 1, all sample characteristics are presented. Some categories could not be completely filled, because too few persons exhibiting those characteristics filled out the questionnaire in that year. It was decided to not increase the number of the other strata, in order to not skew the data too much.

Participants could voluntarily participate in a lottery by entering their e-mail address, with which they could win various prizes (such as a USB-stick, gift voucher or iPad).

Measures

Demographic measures such as age, gender, faculty and living conditions (on their own or still at home) were collected before administration of the questionnaires. Frequency of drug use was assessed by first asking whether or not the student had ever used that drug in their life-time (LT). If they indicated yes, several follow-up questions were asked, from which last-year use (LY) was selected as the variable of interest. The content and structure of these questions were taken from other well-known validated sources such as the Belgian Health Interview. Whenever this was not possible, for example for drugs that were not represented in the previously named survey, the same sentence structure as for the other drugs was used and only the name of the drug was changed. In total, 5 legal drugs were investigated (nicotine, beer, wine, fortified wine and spirits). Two types of medication were also assessed (stimulants
and sedative hypnotics). Finally, students were asked to indicate if they used illegal drugs (cannabis, ecstasy, cocaine or amphetamines).

Statistics

For each substance, only students that indicated having used drugs in the past year were included in the analysis. In order to compare drug use patterns over three years, $\chi^2$ tests were performed for all substances. If this initial analysis showed a significant difference between the three years, separate $\chi^2$ tests between pairs of years (2005-2013, 2009-2013, 2005-2009) were performed to see when exactly substance use differed. For each year separately, additional $\chi^2$ analyses were done to investigate whether there were age (21 years or older vs. under 21 years of age) or gender (male vs female) differences in substance use. Statistical significance was set at $p<.05$ (two-tailed).

To increase the representativeness of the study, all data were weighted according to gender and institution, since distribution of these variables differed from those in the population. All analyses were performed using SPSS 22 (IBM SPSS Statistics for Windows, Version 22.0).

Results

Prevalence of substance use

In Figure 1, data is shown on the percentage of past year drug use in total number of respondents. The corresponding significance values are noted in Table 2.

On average, 36% of all students indicated having smoked tobacco in the past year. However, there was a significant difference between the three years of the questionnaire with regard to the amount of students smoking. From 2005 to 2009, there was a significant decrease in the number of students smoking (from 37.2% to 31.0%, $p<.001$). This effect was reversed in the following year of the questionnaire, 2013, when 40.4% of all students indicated having smoked in the year before.

-insert Figure 1-
There was a significant decrease in the use of fortified alcohol such as port or vermouth from 2005 to 2009 (p<.001) and from 2009 to 2013 (p<.001), going from 73.1% in 2005 to 48.4% in 2013. This decrease in stronger alcoholic drinks was also seen in the consumption of spirits (e.g. vodka, whisky, rum), which significantly decreased from 2005 to 2009 (from 80.6% to 76.1%, p<.01) and then remained around the same level in 2013. There was no change in the use of beer or wine, which respectively 77.4% and 81.5% of all students reported having drunk in the past year on average.

Except for cannabis, there were no changes in illicit drug use over the years of the survey. Illicit drugs, such as cocaine, amphetamines or ecstasy were on average used by 3.5%, 2.5% and 3.2% of all students, respectively. Cannabis was the most used drug of all illicit drugs, although its use decreased significantly over the years. From 2005 to 2013, the past year use of cannabis decreased from 24.5% to 19.2% (p=.001).

Students were also asked whether or not they had used sedative hypnotic medication (benzodiazepines like Valium® or Xanax®) or stimulant medication such as Ritalin® or Concerta®, without classifying if their use was on prescription or not. There was a small number of students indicating having used these drugs in the past year (on average 5.3% and 3.9% respectively), but no changes in use were seen over the years.

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**Age, gender and drug use**

To investigate the role of age and gender in past-year drug use among students, exploratory analyses were done. Over all three years, only for cannabis did all $\chi^2$ tests indicate that age significantly affected the likelihood of use in the past year. However, whereas the pattern for use was similar in 2005 and 2009, with more persons under 21 using cannabis, this was the other way around in 2013 and thus there was no significant age effect spanning all years.

For gender, it was most notable that, on average, male students were less than half as likely as female students to use sedative hypnotics such as Valium® or Xanax® (RR 0.44; CI 0.27-0.74). Men were on average twice as likely as women to have used any illicit drug, using more cocaine, cannabis, XTC and amphetamines than women (RR 2.64, CI 1.44-5.05; RR 1.82, CI 1.50-2.24; RR 2.02; CI 1.10-3.64 and RR 2.02; CI 1.07-3.81 respectively) and also used more stimulant medication (RR 2.14; CI 1.29-3.54). There was little difference in gender for tobacco and alcohol use in general (from minimum RR 1.00 for wine (CI 0.95-1.06) to
maximum RR 1.30 (CI 1.13-1.49) for tobacco, with men using slightly more beer and tobacco than women.

Discussion

This study shows that illegal drug use continues to be an issue in students in the Antwerp region, in particular within the male student subgroup. The most used drug among students remains alcohol, with wine (81.5% on average), beer (77.4% on average) and/or spirits (77.2% on average) being the drinks of choice for most students. However, a decrease in the use of spirits and fortified drinks has been seen over the three years of the questionnaire (from 2005 to 2013), while the use of wine and beer remained constant. Alcohol use among students remains a topic of much debate. Misuse of alcohol, especially through binge drinking, can have numerous consequences, both acute and long-term. For example, drinking large quantities of alcohol can lead to harmful behaviours such as driving under the influence, having (unprotected) sex or exhibiting anti-social behaviour (Van Damme et al., 2013). Long-term heavy drinking can cause permanent damage to the body, such as liver disease or brain damage (Costin & Miles, 2014; Welsh, 1997). In that light, the decrease in use of strong alcohol is encouraging. However, since there was no change in the use of beer or wine, more knowledge needs to be gathered on why this pattern of use occurred the way it did over the years of the study. Furthermore, it would be interesting for future years to see if this pattern continues or if the use of beer and wine follows the same trajectory as the other types of alcohol.

The use of tobacco in the past year among the student population of Antwerp decreased initially from 2005 to 2009 (from 37% to 31%) but showed an increase in 2013 (to 40.4%). This is at odds with a general downward trend in tobacco use in Belgium that went from 30% to 25% in daily and occasional smokers from 1997 to 2014 (Scientific Institute of Public Health, 2014). Since 2005, more and more anti-tobacco laws have been implemented in Belgium, including prohibition of commercials for tobacco products, smoking in restaurants and other public places and increasing tobacco prices. This generalized approach towards smoking prevention has clearly been successful in the Belgian population, as evidenced by a decrease in use. Nonetheless, tobacco use among Antwerp students remains high and shows no sign of decline. Exactly why this is the case is unknown. However, the data currently presented for the Antwerp student population did not take into account whether respondents were daily or occasional smokers. Persons between the age of 14-25 are more likely to experiment with tobacco, alcohol or drugs (EMCDDA, 2014; Young et al., 2002). It
might therefore be the case that the majority of respondents answering ‘yes’ to the question of whether they used tobacco in the past year were persons who smoked only occasionally. Thus, these results might not accurately reflect the true proportion of daily smokers. It is possible that the number of occasional smokers increased while the number of daily smokers decreased, so that the total number of smokers in the last year did not change or even showed an increase. Since the survey included questions as to the use pattern of the participants, it was possible to check this assumption. Post-hoc statistical tests using a log-linear model confirmed this hypothesis. From these analyses, it could be seen that the amount of occasional smokers increased more than the decline in daily smoking from 2005 to 2013. This led to a seeming increase in smoking in the past year in 2013 compared to 2005 and 2009, which in reality was caused by an increase in occasional smokers but a decrease in daily smokers.

Despite a number of legislative and social efforts, the use of illicit drugs other than cannabis has remained stable, but low. Only a small number of students over the years have indicated having used ecstasy, cocaine, or amphetamines, with little to no variation seen in last year use. Notable is the strong decrease in cannabis use from 24% in 2005 to 19% in 2013, although it is still used the most out of all illicit drugs. On average, 22% of all students indicated having used cannabis in the past year, as compared to an average of 3.5% for the next most used drug, cocaine.

The current results on gender differences in past year drug use are in accordance with other publications showing that men are more likely to use drugs than women (see Becker & Hu, 2008), apart from the use of sedative hypnotic medication which is more associated with use by women (John et al., 2007; Rawson & D’Arcy, 1998). The same trends are seen in the student sample where illicit drug use is twice as prevalent among men than among women but where men are less than half as likely to use sedative hypnotic medication than women. Therefore, any policy focusing on decreasing and preventing drug use should take into account both male and female users and the way they might differ in their drug use patterns.

Age did not seem to affect drug use in general very much; only on past year cannabis use could a trend toward more use in younger students (under 21) versus older students (21 or older) be seen. Nevertheless, this information might be used by policymakers (such as university councils) to focus their efforts in drug use prevention on different age groups, whereby the younger and older students might be approached differently.

The data gathered from this study show that a large proportion of students use legal or illegal substances. Alcohol use in particular remains popular among students, since it is used by almost all participants and widely available. Since substance use can lead to a number of
societal and personal problems, prevention of drug use has been a priority for university governing bodies. One of the most promising approaches to prevention of drug use is the social norms approach. The social norms approach aims at addressing behaviour towards, for example, drug use (descriptive norms) as well as making attitudes towards drug use more explicit (injunctive norms) (Berkowitz, 2005; Perkins, 2003). Implementation of a social norms campaign in universities and other institutes of higher education in the United States of America have shown a reduction rate in alcohol and tobacco use of more than 20% (see Berkowitz, 2005) and recent studies have shown the efficacy of social norms approaches in Europe to be comparable to those in the USA (Bewick et al., 2010; Robinson et al., 2014; Teunissen et al., 2014). Combined with the knowledge gathered from the current study about actual student drug use, more research into the social norms of students in higher education regarding the use of drugs could lead to a reduction in (problematic) drug use.

Through the years, the number of students participating in the questionnaire has varied considerably and this could potentially limit the interpretation of the results. While in 2005 22.5% of all students participated, in 2009 this was only 5.4% but this number was raised to 13.7% in 2013. This exemplifies the importance of good promotion of such a study. In 2005, a lot of effort was put into promoting the questionnaire, including handing out flyers, posters and sending out personalized e-mails. In 2009, less attention was paid to the study and therefore the number of participants dropped drastically. In 2013 more attention was paid to the way the study was promoted among the students and the level of participation increased. Another reason for the relatively low number of participants could be that the questionnaire raises sensitive topics. Questionnaires asking about sensitive topics such as drug use, income or sex typically have smaller response rates (Tourangeau & Yan, 2007). We have tried to reduce this effect by making the questionnaire available online, which is generally less threatening, as well as reassuring the participants that nothing they would indicate on the questionnaire would have legal or social consequences and their data would remain confidential. Furthermore, over the years, more and more survey research has been conducted at the University of Antwerp. It could therefore be that the decline in response rate is partly due to the student body becoming disinclined to answer any questionnaire, especially since this questionnaire took quite a lot of time to fill out. However, by drawing a representative sample from the completed questionnaires, we still ensured that the data presented are an accurate representation of the total student population in Antwerp.

In conclusion, over 8 years no change occurred in past year use of illicit drugs such as cocaine or cannabis in Belgian higher education students. The amount of strong alcohol drunk
in the past year, such as spirits or fortified beverages, did decrease significantly from 2005 to 2009 and to 2013. Overall, despite a number of anti-tobacco laws, the use of tobacco in the past year among students in Antwerp did not decrease and neither were there any differences in the use of beer or wine. Gender differences in patterns of drug use show that while male students use more illicit drugs and female students use more sedative hypnotics, there are no gender differences for alcohol or tobacco. Only cannabis use in the past year was affected by age, but a clear overall pattern did not emerge. Clearly, these results show that drug use among students is a complex matter. In order to develop an effective prevention programme to decrease drug use, university councils could learn from the social norms approach.

Acknowledgements
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References


Social motives for drinking in students should not be neglected in efforts to decrease problematic drinking. *Health Education Research*, 28(4), 640–650.

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**Figures and tables**

**Figure 1:** Last year (LY) drug use in students calculated as a percentage of the total number of all respondents. ¥ = significant $\chi^2$ test over all years (p<.01) I = significant difference (p<.05) between 2005 and 2013. * = significant difference between subsequent years (p<.05)

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Sample</th>
<th>Population</th>
<th>Sample</th>
<th>Population</th>
<th>Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>24478</td>
<td>1451</td>
<td>29210</td>
<td>1405</td>
<td>31950</td>
<td>1295</td>
</tr>
<tr>
<td>2009</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>24478</td>
<td>1451</td>
<td>29210</td>
<td>1405</td>
<td>31950</td>
<td>1295</td>
</tr>
<tr>
<td>Age (mean)</td>
<td>20 (19 - 22) *</td>
<td>20.6 ± 2.0</td>
<td>21.4 ± 3.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender (male)</td>
<td>46.3%</td>
<td>45.3%</td>
<td>46.7%</td>
<td>43.9%</td>
<td>46.3%</td>
<td>43.40%</td>
</tr>
<tr>
<td>Response rate**</td>
<td>22.5%</td>
<td>5.4%</td>
<td></td>
<td></td>
<td>13.70%</td>
<td></td>
</tr>
</tbody>
</table>

**Table 1:** Sample characteristics of 2005, 2009 and 2013 student questionnaires.

* for 2005 data were measured on an ordinal level, therefore the median and interquartile range is reported instead of the mean.

** response rate is measured as the number of respondents relative to the total student population.
<table>
<thead>
<tr>
<th></th>
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<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tobacco</td>
<td>37.2</td>
<td>59.6</td>
<td>40.4</td>
<td>63.4</td>
</tr>
<tr>
<td>Beer</td>
<td>78.3</td>
<td>85.2</td>
<td>76.5</td>
<td>88.8</td>
</tr>
<tr>
<td>Wine</td>
<td>83.3</td>
<td>89.0</td>
<td>81.5</td>
<td>92.4</td>
</tr>
<tr>
<td>Fortified alcoholic drinks</td>
<td>73.1</td>
<td>86.0</td>
<td>48.4</td>
<td>72.1</td>
</tr>
<tr>
<td>Spirits</td>
<td>80.6</td>
<td>87.8</td>
<td>75.1</td>
<td>90.5</td>
</tr>
<tr>
<td>Sedative-hypnotics</td>
<td>4.5</td>
<td>33.7</td>
<td>5.3</td>
<td>48.9</td>
</tr>
<tr>
<td>Stimulant medication</td>
<td>3.3</td>
<td>33.3</td>
<td>4.3</td>
<td>58.9</td>
</tr>
<tr>
<td>Cannabis</td>
<td>24.5</td>
<td>50.4</td>
<td>19.2</td>
<td>53.3</td>
</tr>
<tr>
<td>XTC</td>
<td>3.0</td>
<td>28.3</td>
<td>3.7</td>
<td>55.8</td>
</tr>
<tr>
<td>Cocaine</td>
<td>3.2</td>
<td>28.2</td>
<td>3.5</td>
<td>49.5</td>
</tr>
<tr>
<td>Amphetamine</td>
<td>2.4</td>
<td>22.2</td>
<td>2.6</td>
<td>48.6</td>
</tr>
</tbody>
</table>
Table 2: A) The percentage of persons indicating having used a certain drug in the past year as a proportion of all respondents and as a proportion of persons indicating having ever used that drug. B) Results of 2 tests comparing the difference between years in last year drug use as a proportion of all respondents (p, pearson value).